**Supplementary Material-Table S1** Sequences information for all samples used in the present study. Sequences newly generated in this study are marked in bold. Some taxa have two accession numbers under the maker ‘*trnL-F*’, indicating that the entire ‘*trnL-F*’ was disintegrated as two smaller sections in sequencing process in previous studies that producing these sequences, and then the two sections were combined in phylogenetic analysis.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Taxa | GenBank accession numbers | | | | |
| *matK* | *rbcL* | *rps16* intron | *trnL-F* | nrITS |
| *Adenonema cherleriae* (Fisch. ex Ser.) M.T.Sharples & E.Tripp | **OP617346** | **OP617351** | **OP617356** | **OP617361** | **OP626174** |
| *Brachystemma calycinum* D.Don | **OP617347** | **OP617355** | **OP617358** | **OP617365** | **OP626178** |
| *Cerastium arvense* L. | AY936295 | JX848446 | MH243535 | FJ404976 | MH219805 |
| *Cerastium beeringianum* Cham. & Schltdl. | KC474448 | KC482422 | — | AY521318, AY521365 | MG236459 |
| *Cerastium davuricum* Fisch. ex Spreng. | KX158358 | KX158395 | KX158432 | — | KX158321 |
| *Cerastium dichotomum* L. subsp. *inflatum* (Link) Cullen | KX158359 | KX158396 | KX158433 | — | KX158322 |
| *Cerastium dinaricum* Beck & Szyszył. | — | — | — | KJ716526 | KJ716515 |
| *Cerastium falcatum* (Ser.) Bunge | — | — | MH243537 | AY521334, AY521382 | MH219807 |
| *Cerastium fontanum* Baumg. | KX821263 | KF602216 | FJ404899 | FJ404977 | GU444015 |
| *Cerastium furcatum* Cham. & Schltdl. | MH116578 | MH116103 | — | — | MH117479 |
| *Cerastium glomeratum* Thuill. | JN895359 | HM849882 | — | KY697436 | AY857977 |
| *Cerastium jiuhuashanense* Gang Yao et. J.W. Zhai | MT507771 | MT507771 | MT507771 | MT507771 | MT791125 |
| *Cerastium latifolium* L. | — | KF602212 | — | AY521301, AY521348 | — |
| *Cerastium nutans* Raf. | MK519892 | MK525532 | MT624650 | AY521339, AY521387 | MT624569 |
| *Cerastium nigrescens* (H.C.Watson) Edmondston ex H.C.Watson | — | KF997275 | — | AY521315, AY521362 | KX165939 |
| *Cerastium pusillum* Ser. | JN589226 | — | — | JN589683 | JN589112 |
| *Cerastium regelii* Ostenf. | KC474450 | KC482424 | — | AY521317, AY521364 | MG236500 |
| *Cerastium subtriflorum* Dalla Torre & Sarnth. | — | — | — | KJ716527 | MH537035 |
| *Cerastium szechuense* F.N. Williams | — | — | — | JN589674 | JN589116 |
| *Cerastium tomentosum* L. | JN589244 | KF997321 | MH243538 | AY521310, AY521357 | JN589031 |
| *Dichodon cerastoides* (L.) Rchb. | — | MG249356 | MH243542 | AY521340, AY521388 | MH219812 |
| *Dichodon dubium* (Bastard) Ikonn. | — | — | MH243544 | AY521341, AY521389 | MH219815 |
| *Hartmaniella oxyphylla* (B.L. Rob.) M.L. Zhang | KX158348 | KX158385 | KX158422 | — | KX158311 |
| *Hartmaniella sierra* (Rabeler & R.L. Hartm.) M.L. Zhang | KX158351 | KX158388 | KX158425 | — | KX158314 |
| *Holosteum marginatum* C.A. Mey. | JN589261 | — | — | JN589732 | JN589093 |
| *Holosteum umbellatum* L. | MK520188 | MK525977 | FJ404909 | JN589655 | JN589051 |
| *Lepyrodiclis holosteoides* (C. A. Mey.) Fisch. et Mey. | FJ404840 | JQ933385 | KP149043 | FJ404989 | MH808295 |
| *Mesostemma platyphyllum* (Rech.f.) Rech.f. | — | — | MT624666 | — | MT624584 |
| *Mesostemma perfoliatum* (Rech.f.) Rech.f. | — | — | MT624665 | — | MT624583 |
| *Mesostemma kotschyanum* (Fenzl ex Boiss.) Vved. | — | — | MT624664 | — | MT624582 |
| *Moenchia erecta* (L.) G. Gaertn., B. Mey. & Scherb. | JN895271 | JN892479 | FJ404926 | FJ405002 | JN589103 |
| *Nubelaria arisanensis* (Hayata) M.T.Sharples & E.A.Tripp | JN589258 | MT384967 | — | — | JN589096 |
| *Nubelaria diversiflora* (Maxim.) M.T.Sharples & E.A.Tripp | JN589235 | — | MT624669 | LC568827 | JN589119 |
| *Odontostemma barbatum* (Franch.) Sadeghian & Zarre | — | — | — | — | KP148852 |
| *Odontostemma fridericae* (Hand.-Mazz.) Sadeghian & Zarre | — | — | — | — | AY936332 |
| *Odontostemma leucasterium* (Mattf.) Rabeler & W.L. Wagner | MK341306 | — | MK341256 | MK341198 | MK341342 |
| *Odontostemma melanandrum* (Maxim.) Rabeler & W.L. Wagner | MK341378 | — | MK341255 | MK341197 | MK341343 |
| *Odontostemma roseiflorum* (Sprague) Sadeghian & Zarre | FJ404825 | — | FJ404895 | FJ404971 | AY936244 |
| *Odontostemma saginoides* (Maxim.) Rabeler & W. L. Wagner | — | — | — | — | MT791129 |
| *Odontostemma spathulifolium* (C. Y. Wu ex L. H. Zhou) Rabeler & W. L. Wagner | — | — | — | — | MT791131 |
| *Odontostemma trichophorum* (Franch.) Sadeghian & Zarre | — | — | — | — | AY936243 |
| *Pseudostellaria jamesiana* (Torr.) W.A. Weber & R.L. Hartm.\_ZXQ\_8 | KX158343 | KX158380 | KX158417 | — | KX158306 |
| *Pseudostellaria jamesiana* (Torr.) W.A. Weber & R.L. Hartm. | FJ404861 | MF963180 | FJ404933 | FJ405010 | JN589048 |
| *Pseudostellaria japonica* (Korsh.) Pax | KX158344 | KX158381 | KX158418 | KY063323 | KX158307 |
| *Pseudostellaria maximowicziana* (Franch. & Sav.) Pax | KX158346 | KX158383 | KX158420 | — | KX158309 |
| *Pseudostellaria tianmushanensis* G.H. Xia & G.Y. Li | KX158355 | KX158392 | KX158429 | — | KX158318 |
| *Pseudostellaria tibetica* Ohwi *\_ZXQ\_21* | KX158347 | KX158384 | KX158421 | — | KX158310 |
| *Pseudostellaria tibetica* Ohwi *\_ZXQ\_22* | KX158354 | KX158391 | KX158428 | — | KX158317 |
| *Pseudostellaria davidii* (Franch.) Pax *\_ZXQ\_1* | KX158338 | KX158375 | KX158412 | KY063300 | KX158301 |
| *Pseudostellaria ebracteata* (Kom.) N.S.Pavlova*\_ZXQ\_3* | KX158340 | KX158377 | KX158414 | — | KX158303 |
| *Pseudostellaria europaea* Schaeftl.*\_ZXQ\_4* | KX158356 | KX158393 | KX158430 | — | KX158319 |
| *Pseudostellaria\_heterantha* (Maxim.) Pax*\_ZXQ\_5* | KX158341 | KX158378 | KX158415 | — | KX158304 |
| *Pseudostellaria\_rigida* (Komarov) Pax*\_ZXQ\_15* | KX158349 | KX158386 | KX158423 | — | KX158312 |
| *Pseudostellaria rupestris* (Turcz.) Pax*\_ZXQ\_16* | KX158350 | KX158387 | KX158424 | — | KX158313 |
| *Pseudostellaria sylvatica* (Maxim.) Pax*\_ZXQ\_18* | KX158352 | KX158389 | KX158426 | KY063325 | KX158315 |
| *Pseudostellaria longipedicellata* S.Lee, K.I.Heo & S.C.Kim | NC\_039454 | NC\_039454 | NC\_039454 | NC\_039454 | KY063140 |
| *Pseudostellaria okamotoi* Ohwi | NC\_039974 | NC\_039974 | NC\_039974 | NC\_039974 | KY063147 |
| *Pseudostellaria setulosa* Ohwi | NC\_041462 | NC\_041462 | NC\_041462 | NC\_041462 | KY063182 |
| *Pseudostellaria palibiniana* (Takeda) Ohwi | NC\_041166 | NC\_041166 | NC\_041166 | NC\_041166 | KY078450 |
| *Pseudostellaria heterophylla* (Miq.) Pax | NC\_044183 | NC\_044183 | NC\_044183 | NC\_044183 | MH808298 |
| *Rabelera holostea* (L.) M.T.Sharples & E.Tripp | KX183916 | FJ395575 | MH243549 | JN589664 | KX183997 |
| *Schizotechium paniculatum* (Edgew.) Pusalkar & S.K.Srivast. | **OP617350** | **OP617353** | **OP617360** | **OP617362** | **OP626176** |
| *Schizotechium monospermum* (Buch.-Ham. ex D.Don) Pusalkar & S.K. Srivast. | JN589243 | — | — | — | JN589153 |
| *Shivparvatia ciliolata* (Edgew.) Pusalkar & D. K. Singh | — | — | — | — | KP148859 |
| *Shivparvatia forrestii* (Diels) Rabeler | MK341374 | — | MK341251 | MK341193 | MK341340 |
| *Shivparvatia glanduligera* (Edgew.) Pusalkar & D.K.Singh | MK341375 | — | MK341252 | MK341194 | MK341341 |
| *Shivparvatia melandryoides*(Edgew.) Satish Chandra and D. S. Rawat | — | — | — | — | MT791126 |
| *Shivparvatia stracheyi* (Edgew.) Pusalkar & D. K. Singh | — | — | — | — | KP148898 |
| *Stellaria alsine* Grimm | HM850778 | HM850385 | — | EU785987 | AY438312 |
| *Stellaria aquatic* (L.) Scop. | JN894058 | KM360890 | MH243547 | FJ405004 | AY594303 |
| *Stellaria americana* (Porter ex B.L. Rob.) Standl.\_ ZXQ-34 | KX158372 | KX158409 | KX158446 | — | KX158335 |
| *Stellaria americana* (Porter ex B.L. Rob.) Standl. | JN589202 | — | — | JN589675 | JN589090 |
| *Stellaria bistylata* W. Zh. Di et Y. Ren | MK534858 | MK534811 | — | — | MK555247 |
| *Stellaria bistylata* W. Zh. Di et Y. Ren\_YG208 | **OP617348** | **OP617354** | **OP617357** | **OP617364** | **OP626175** |
| *Stellaria borealis* Bigelow | JN589285 | MG247728 | — | JN589713 | JN589064 |
| *Stellaria chinensis* Regel | JN589241 | — | — | EU785990 | JN589133 |
| *Stellaria corei* Shinners | JN589300 | — | — | JN589715 | JN589046 |
| *Stellaria crassifolia* Ehrh. | KC475924 | KC484145 | — | JN589701 | JN589071 |
| *Stellaria cuspidata* Willd. ex D.F.K. Schltdl. | JN589268 | — | FJ404952 | JN589641 | JN589099 |
| *Stellaria delavayi* Franch | **OP617349** | **OP617352** | **OP617359** | **OP617363** | **OP626177** |
| *Stellaria graminea* L. | MK520714 | KM360998 | MH243548 | JN589687 | AY594304 |
| *Stellaria longifolia* Muhl. ex Willd. | MK520715 | JX848448 | — | GQ245567 | JN589146 |
| *Stellaria longipes* Goldie | KC475949 | JX848449 | — | JN589672 | JN589086 |
| *Stellaria media* (L.) Vill. | HM850779 | AF206823 | Z83152 | EU785989 | MK044722 |
| *Stellaria nemorum* L. | AY936298 | JN893484 | — | HM590349 | AY936246 |
| *Stellaria palustris* Ehrh. ex Retz. | MK520716 | KX158401 | KX158438 | — | JN589080 |
| *Stellaria pentastyla* W.Qiao Wang, H.F. Xu & Z.H. Ma\_SC0054 | MN892512 | — | — | MN892507 | MN879262 |
| *Stellaria pentastyla* W.Qiao Wang, H.F. Xu & Z.H. Ma\_YN0014 | MN892511 | — | — | MN892506 | MN879261 |
| *Stellaria pubera* Michx. | FJ404878 | KP643834 | — | FJ405027 | JN589127 |
| *Stellaria soongorica* Roshev. | MF158660 | KX158402 | KX158439 | — | KX158328 |
| *Stellaria umbellata* Turcz. | JN589254 | MG246195 | — | JN589737 | JN589109 |
| *Stellaria vestita* Kurz | MH116882 | MH116433 | — | EU785988 | MH117776 |
| **Outgroups** |  |  |  |  |  |
| *Arenaria serpyllifolia* L. | KX158357 | KX158394 | KX158431 | FJ404972 | KX158320 |
| *Arenaria lanuginose* (Michx.) Rohrb. | FJ404821 | MH028838 | FJ404891 | FJ404968 | KP148878 |
| *Corrigiola litoralis* L. | FN825767 | FN868311 | FJ404902 | FJ404979 | HE602452 |
| *Telephium imperati* L. | FN825768 | FN868312 | FJ404955 | JN589742 | JN589092 |
| *Herniaria glabra* L. | MK926048 | AF132091 | KY513562 | JN589730 | AJ310965 |
| *Paronychia kapela* A.Kern. | AY936284 | — | KY513568 | KY616130 | AJ310967 |
| *Gymnocarpos decandrus* Forssk. | FJ404837 | MT645209 | KX012950 | KY616122 | KX012968 |
| *Drymaria* | MH551956 | KJ773466 | FJ404905 | FJ404983 | FJ980408 |
| *Pycnophyllum* | FJ460219 | DQ267194 | FJ404934 | FJ405011 | JN589108 |
| *Loeflingia* | AY936288 | MF963375 | AM501419 | JN589659 | MF964124 |
| *Spergularia marina* | KY952512 | HM850381 | KY513599 | KY616160 | MH808307 |
| *Spergula arvensis* L. | JN589292 | KM360994 | KY513576 | KY616142 | JX274532 |
| *Eremogone baxoiensis* (L.H.Zhou) Dillenb. & Kadereit | MK341380 | — | MK341258 | MK341199 | MK341313 |
| *Eremogone capillaris* (Poir.) Fenzl | KC474711 | MG249014 | KP149011 | GQ244597 | KP148909 |
| *Eremogone acicularis* (F.N.Williams ex Keissl.) Ikonn. | MK341301 | — | MK341286 | MK341227 | MK341309 |
| *Arenaria densissima* Wall. | MK341362 | — | MK341232 | MK341174 | MK341345 |
| *Arenaria oreophila* Hook.f. | MK341298 | — | MK341245 | MK341187 | MK341356 |
| *Thylacospermum caespitosum* (Cambess.) Schischk. | MK341373 | — | MK341250 | MK341192 | MK341359 |
| *Agrostemma githago* L. | FJ589503 | KM360618 | Z83154 | JN589684 | JN589107 |
| *Heliosperma* | FJ589506 | — | LC423845 | JN589653 | LC424045 |
| *Silene aprica* Turcz. | MH658952 | KX158399 | LC423907 | FN821322 | MK555254 |
| *Atocion* | FJ589504 | HG417049 | FJ376820 | KY697498 | FJ384033 |
| *Schiedea membranacea* H.St.John | DQ907816 | DQ907762 | GQ224312 | FJ405015 | AY517662 |
| *Mononeuria glabra* (Michx.) Dillenb. & Kadereit | HQ235325 | HQ235608 | AY727451 | AY727206, AY727239 | MK355977 |
| *Scleranthus annuus* L. | FJ404869 | AY270145 | FJ404943 | JN589638 | JX274538 |
| *Sagina* | KF737569 | KF997390 | FJ404935 | JN589717 | MH808303 |
| *Colobanthus* | FJ404830 | JQ933274 | FJ404901 | JN589705 | MH781182 |
| *Bufonia* | FJ404827 | KX709610 | FJ404897 | FJ404974 | JN589044 |
| *Moehringia* | FJ404851 | KM360884 | FJ404924 | FJ405000 | JX274536 |
| *Psammosilene tunicoides* W.C.Wu & C.Y.Wu | NC\_045947 | NC\_045947 | NC\_045947 | NC\_045947 | JN589122 |
| *Dianthus caryophyllus* L. | NC\_039650 | NC\_039650 | NC\_039650 | NC\_039650 | KU722881 |
| *Acanthophyllum* | JN589209 | — | MN310752 | JN589663 | JN589016 |
| *Gypsophila vaccaria* (L.) Sm. | NC\_040936 | NC\_040936 | NC\_040936 | NC\_040936 | MH711400 |
| *Chenopodium album* Bosc. ex Moq. | MW417304 | MW417304 | MW417304 | MW417304 | MN396437 |
| *Amaranthus hybridus* L. | NC\_053787 | NC\_053787 | NC\_053787 | NC\_053787 | MT811921 |
| *Salicornia brachiate* Miq. | NC\_027224 | NC\_027224 | NC\_027224 | NC\_027224 | KF848296 |
| *Bienertia sinuspersici* Akhani | KU726550 | KU726550 | KU726550 | KU726550 | DQ499349 |
| *Achatocarpus nigricans* Triana | MK397908 | MK397908 | MK397908 | MK397908 | — |
| *Phaulothamnus spinescens* A.Gray | MH286322 | MH286322 | MH286322 | MH286322 | — |
| *Macarthuria keigheryi* Lepschi | MK397926 | MK397926 | MK397926 | MK397926 | — |